Field Modification Form
Lower Passaic River Restoration Project
Remedial Investigation
Project No: 60145884

AECOM

Field Modification Number: FM-120821-1
Document (plan or SOP title and date) *Quality Assurance Project Plan for Lower Passaic River Restoration Project: Periodic Bathymetric Surveys, Rev. 2, May 2010*
Activity: Performing Bathymetric Survey of Lower 14 Miles of the Passaic River After a Period of Below Average River Flows
Proposed Modification: The Periodic Bathymetric Surveys Quality Assurance Project Plan (QAPP) is modified by this Field Modification Form to include performance of a bathymetric survey of the entire lower 14 miles of the Passaic River after the 2012 extended period of low river flows. Figures 1 and 2 attached to this field modification form shows the 2012 Passaic River flows compared to the period of record at two gauge stations: Little Falls and Dundee Dam at Clifton. As these figures show the 2012 flows, as measured as mean daily discharge, were significantly below the median daily flow for the winter and spring periods when high flows typically occur.

Work will be performed following the procedures used during the 2010 and 2011 surveys (*Quality Assurance Project Plan for Lower Passaic River Restoration Project: Periodic Bathymetric Surveys*, Rev. 2, May 2010). Consistent with the scope describe in the Periodic Bathymetric QAPP, the survey will include a multi beam survey of the entire lower 14 miles of the Passaic River and single beam survey river cross sections at 13 locations. Additional single beam surveys will be performed during this 2012 survey. The scope of these additional single beam surveys will be described in a separate field modification form.

The Periodic Bathymetric Surveys QAPP is modified by this Field Modification Form as described below:

The Task Manager will be Doug Simmons of AECOM.

Worksheets 10 (Problem Definition) and 11 (Project Quality Objectives/Systematic Planning Process Statements) are modified as follows:

The stability of the Lower Passaic River (LPR) river bottom sediments must be understood to characterize the fate and transport of contaminated sediments as well as to select and design appropriate remedial solutions. Sediment stability is expected to vary over (1) location along the river and (2) over time given the varied morphology of the river and the varied nature of the hydrodynamic forces acting on river bottom sediments. Sediment stability can be evaluated in part by comparing river bottom depths between periodic bathymetric survey events. The results offer a line of evidence (in addition to sampling/physical characterization, radio dating, probing, and geophysical investigations) to identify erosional, stable, or depositional areas along the river and help develop the relationship between sediment stability and hydrodynamic conditions.

The extended period of low river flows during 2012 may provide a potential opportunity to evaluate ongoing sediment infilling that occurs during low flow periods. River flows in 2012 have been below the period of record average flows for several months during the year, without the typical winter and spring high flow events. During periods of 2012 the flow was up to one order of magnitude below the period of record average flow. A comparison of bathymetric data before (October 2011) and during the period of extended low flows (August 2012) provides a potential opportunity to characterize upriver estuarine transport of sediments that has been observed historically in the LPR. Given the short time frame between surveys (less than one year), the error and uncertainty inherent in bathymetric data and low rates of infilling:

- Uncertainty in the depth-difference data (previously assumed to be ±1 ft (AECOM 2010) may not allow the resolution to characterize any infilling that may have occurred during the period of low flows; and,
- Low sedimentation rates (<1 inch/year) in areas identified by EPA as being in quasi-equilibrium may not be discernible in the resolution of the data.

The data may only be sufficient to provide a qualitative or semi-quantitative evaluation of net changes over large areas, and may not support evaluation of local changes.

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The schedule in QAPP Worksheet 16 is modified as follows:

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Planning of Bathymetry Survey	de maximis, inc./AECOM/ GBA	August 2012	August 2012	Field Modification Form	August 2012
Performance of Bathymetry Survey	AECOM/GBA	August 2012	September 2012	Raw data files	Delivered along with the processed data
Processing of Survey Data	GBA	October 2012	November 2012	Processed data files, supporting files, and contour maps of elevation of the sediment surface within the study area	Approximately 30 days following completion of field survey
Quality Review and Evaluation of Survey Data	de maximis, inc./AECOM	November 2012	December 2012	Bathymetry Survey Report	December 2012
Preparation and Delivery of Survey Summary Report	de maximis, inc. / AECOM	November 2012	December 2012	Survey Summary Report	December 2012

Effective Date: August 23, 2012

Rationale: This Field Modification Form provides an updated schedule and data quality objective for the 2012 survey requested by US EPA.

Submitted by: Doug Simmons	**Date:** August 21, 2012
FTM Approval: William Bonney	**Date:** August 21, 2012
Project QA Manager Approval: Debra L. Simmons	**Date:** August 21, 2012
Task Manager Approval: Douglas E. Simmons	**Date:** August 21, 2012

Figure 1: 2012 Passaic River Flows at Little Falls NJ Compared to Period of Record

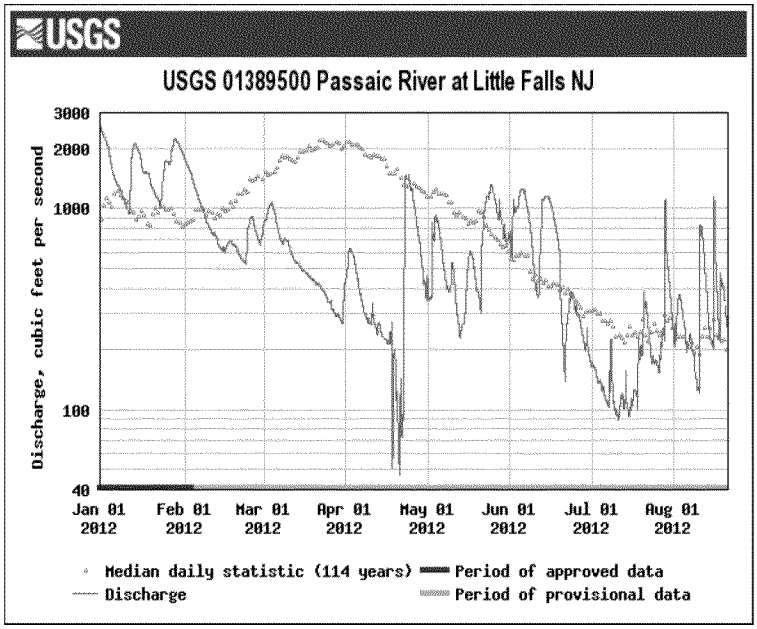

Figure 2: 2012 Passaic River Flows at Dundee Dam at Clifton NJ Compared to Period of Record